操作系统作业2

1. Including the initial parent process, how many processes are created by the program shown in Figure 1?



Figure 1: Program for Question 1.

答：共创建4+3+2+1 = 10 个子进程

1. Explain the circumstances under which the line of code marked printf (‘‘LINE J’’) in Figure 2 will be reached.

Figure 2: Program for Question 2.

答：若程序执行至printf（“LINE J”），则说明：

1. 父进程成功创建子进程
2. 子进程执行ls程序时出错
3. Using the program in Figure 3, identify the values of pid at lines A, B, C, and D. (Assume that the actual pids of the parent and child are 2600 and 2603, respectively.)



Figure 3: Program for Question 3.

答： A: 变量 pid为fork()对子进程的返回值，为 0

B: 变量 pid1 为子进程 PID, 值为2603

C: 变量 pid 为子进程 PID, 值为 2603

D: 变量 pid1 为getpid()获取的父进程PID,值为 2600

1. Using the program shown in Figure 4, explain what the output will be at lines X and Y.

Figure 4: Program for Question 4.

1. For the program in Figure 5, will LINE X be executed, and explain why.

int main(void) {

printf("before execl ...\n");

execl("/bin/ls", "/bin/ls", NULL);

printf("after execl ...\n"); /\*LINE: X\*/

return 0;

}

Figure 5: Program for Question 5.

1. Explain why “terminated state” is necessary for processes.
2. Explain what a zombie process is and when a zombie process will be eliminated (i.e., its PCB entry is removed from kernel).